SAF-RC-232
100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt	H4-21	KW 10/28/13 INITIAL/DATE

COMMENTS:

SDG XP0015 SAF-RC-232

Sample Location: 600-373

Date: 28 October 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-373
Subject: Diesel Range Organics - Data Package No. XP0015-GEL

INTRODUCTION

This memo presents the results of data validation on Data Package No. XP0015 prepared by GEL Laboratories (GEL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RW08	9/23/13	Soil	C	See note 1
J1RW09	9/23/13	Soil	C	See note 1

1 – Diesel range organics by NWTPH-d.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Analytes must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field (equipment) Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of

compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. XP0015 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DIESEL RANGE ORGANICS DATA QUALIFICATION SUMMARY*

SDG: XP0015	REVIEWER: ELR	Project: 600-373	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 2, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-232 Soil

Client SDG: XP0015

Client Sample ID:	J1RW08	Project:	WCHN00213
Sample ID:	334065001	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	23-SEP-13 07:10		
Receive Date:	25-SEP-13		
Collector:	Client		
Moisture:	7.42%		

V 10/22/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2340	2340	7200	ug/kg	1	BYT1	10/01/13	1340	1334412	1
Motor Oil (C20-C36)	B	46500	2340	7200	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VSG1	09/27/13	1130	1334411

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	579 ug/kg	720	80.4	(50%-150%)

Notes:

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 2, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-232 Soil

Client SDG: XP0015

Client Sample ID:	J1RW09	Project:	WCHN00213
Sample ID:	334065002	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	23-SEP-13 07:15		
Receive Date:	25-SEP-13		
Collector:	Client		
Moisture:	7.78%		

10/22/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	J	2570	2350	7220	ug/kg	1	BYT1	10/01/13	1419	1334412	1
Motor Oil (C20-C36)	B	38100	2350	7220	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VSG1	09/27/13	1130	1334411

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	654 ug/kg	722	90.6	(50%-150%)

Notes:

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

FID Diesel Range Organics
WC-HANFORD, INC. (WCHN)
SDG XP0015

Method/Analysis Information

Procedure:	**Analysis of Diesel Range Organics by Flame Ionization Detector**
Analytical Method:	NWTPH-Dx in Soil
Prep Method:	SW846 3541
Analytical Batch Number:	1334412
Prep Batch Number:	1334411

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx in Soil:

Sample ID	Client ID
334065001	J1RW08
334065002	J1RW09
1202955971	Method Blank (MB)
1202955972	Laboratory Control Sample (LCS)
1202955973	334065002(J1RW09) Matrix Spike (MS)
1202955974	334065002(J1RW09) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-003 REV# 24.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standards (ICV or CCV) met the acceptance criteria for target analytes. Analyte peaks eluted within the established retention time windows for this method.

Surrogate recovery did not meet the acceptance criteria in one of the standards analyzed for this SDG; however, this had no adverse effects on the data as the surrogate recovery was well within the acceptance range in the samples associated with this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria; however, the MB was detected with low level (below the PQL) of Motor Oil range hydrocarbons.

Surrogate Recoveries
All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 334065002 (J1RW09) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recovery was within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Electronic Package Comment

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

Manual Integrations
Manual integration was required for surrogates.

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

3341065

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-232-051	Page 1 of 1

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code / Data Turnaround
AJ Dunnum	Joan Kessner	375-4688	KESSNER, JH	8C / 15 Days
Project Designation	**Sampling Location**		**SAF No.**	
100-IU-2 & 100-IU-6 Remaining Waste Sites	600-373		RC-232	
Ice Chest No.	**Field Logbook No.**	**COA**	**Method of Shipment**	
WCH-11-014	EL-1666-01	0603732000	Commerical Carrier - fed EX	
Shipped To	**Offsite Property No.**		**Bill of Lading/Air Bill No.**	
GEL Laboratories, LLC	A120953		See OSPC	

Other Labs Shipped To: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	125mL	125mL	125mL	125mL							
Sample Analysis	See item (1) in Special Instructions	TPH-Diesel Range - WTPH-D +	PAHs - 8310	PCBs - 8082							

Sample No.	Matrix	Sample Date	Sample Time									
J1RW08	SOIL	9-23-13	0710	X	X	X	X					
J1RW09	SOIL	9-23-13	0715	X	X	X	X					

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
AJ Dunnum	9-25-13 0720	MA Bamberger	9-23-13 0720
MA Bamberger	9-23-13 1624	CHAR HALL	9-23-13 16:24
Char Hall	9-23-2013 16:30	Cindy Bingham	9-23-13 1630
Cindy Bingham	9-23-13 1638	1060 Battelle, Fridge	1A 9-23-13 1638
1060 Battelle, Fridge	1A 9-24-13 1020	C Bingham	9-24-13 1020
C. Bingham	WCH 9-24-13 1025	Fed EX	
Fedex		H Taylor	09253 0900

FINAL SAMPLE DISPOSITION: Disposal Method / Disposed By / Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc), Mercury - 7471 - (CV) (Mercury)

REVIEWED BY K. Wood WCH DATE 9-24-13

XP0015

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-373			DATA PACKAGE: XP0015		
VALIDATOR: ELR		LAB: Cel		DATE: 10/22/13	
			SDG: XP0015		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
JIRWO4 JIRWO5					
				Soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments:

no PAS

GENERAL ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A
Duplicate results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
Field duplicate RPD values acceptable? ..... Yes No N/A
Field split RPD values acceptable? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No N/A
Samples properly prepared? (Levels D, E) ..... Yes No N/A
Detection limits meet RDL? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A
Lot check performed? ..... Yes No N/A
Check recoveries aceptable? ..... Yes No N/A
Check materials traceable? ..... Yes No N/A
Check materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A
Comments: _____

Appendix 6

Additional Documentation Requested by Client

QC Summary

Report Date: October 2, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: Joan Kessner

Workorder: 334065 Client SDG: XP0015 Project Description: RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Diesel Range Organics											
Batch 1334412											
QC1202955972 LCS											
Diesel Range Organics (C10-C20)	66600				57500	ug/kg		86.4	(70%-130%)	BYT1	10/01/13 13:01
Motor Oil (C20-C36)	66600			B	58400	ug/kg		87.7	(70%-130%)		
**o-Terphenyl	666				624	ug/kg		93.6	(50%-150%)		
QC1202955971 MB											
Diesel Range Organics (C10-C20)				U	2170	ug/kg					10/01/13 12:22
Motor Oil (C20-C36)				J	2210	ug/kg					
**o-Terphenyl	667				643	ug/kg		96.4	(50%-150%)		
QC1202955973 334065002 MS											
Diesel Range Organics (C10-C20)	72300	J	2570		63300	ug/kg		84	(70%-130%)		10/01/13 14:58
Motor Oil (C20-C36)	72300	B	38100	B	99700	ug/kg		85.3	(70%-130%)		
**o-Terphenyl	723		654		568	ug/kg		78.6	(50%-150%)		
QC1202955974 334065002 MSD											
Diesel Range Organics (C10-C20)	72300	J	2570		61200	ug/kg	3.36	81.1	(0%-20%)		10/01/13 15:37
Motor Oil (C20-C36)	72300	B	38100	B	100000	ug/kg	0.599	86.1	(0%-20%)		
**o-Terphenyl	723		654		546	ug/kg		75.5	(50%-150%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

Date: 28 October 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-373
Subject: Inorganic - Data Package No. XP0015-GEL

INTRODUCTION

This memo presents the results of data validation on Data Package No. XP0015 prepared by GEL Laboratories (GEL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RW08	9/23/13	Soil	C	See note 1
J1RW09	9/23/13	Soil	C	See note 1

1 – Metals by 7471B & mercury by 7471B.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
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DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all silicon (25.2%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable,

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. XP0015 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike recoveries outside QC limits, all silicon (25.2%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All

other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

INORGANICS DATA QUALIFICATION SUMMARY*

SDG: XP0015	REVIEWER: ELR	Project: 600-373	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silicon	J	All	MS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 8, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0015

Client Sample ID: J1RW08
Sample ID: 334065001
Matrix: SOIL
Collect Date: 23-SEP-13 07:10
Receive Date: 25-SEP-13
Collector: Client
Moisture: 7.42%

Project: WCHN00213
Client ID: WCHN001

10/29/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00425	0.00425	0.0127	mg/kg	1	NOR1	09/27/13	1147	1334136	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		6650	6.94	20.4	mg/kg	1	HSC	09/27/13	2159	1333881	2
Arsenic	M	35.9	0.510	3.06	mg/kg	1					
Barium		72.5	0.102	0.510	mg/kg	1					
Beryllium		0.594	0.102	0.510	mg/kg	1					
Boron	B	1.51	1.02	5.10	mg/kg	1					
Cadmium	B	0.289	0.102	0.510	mg/kg	1					
Calcium		3230	8.17	25.5	mg/kg	1					
Chromium		11.5	0.153	0.510	mg/kg	1					
Copper		12.4	0.306	1.02	mg/kg	1					
Iron		19600	8.17	25.5	mg/kg	1					
Magnesium		4100	8.68	30.6	mg/kg	1					
Manganese		309	0.204	1.02	mg/kg	1					
Molybdenum	B	0.406	0.204	1.02	mg/kg	1					
Nickel		10.1	0.153	0.510	mg/kg	1					
Potassium	*N	1600	6.53	25.5	mg/kg	1					
Silicon	*MN	533	1.53	10.2	mg/kg	1					
Silver	B	0.316	0.102	0.510	mg/kg	1					
Sodium		87.2	7.15	25.5	mg/kg	1					
Lead		96.8	0.337	1.02	mg/kg	1	JWJ	10/02/13	1058	1333881	3
Antimony	DU	1.68	1.68	5.10	mg/kg	5	HSC	10/02/13	1130	1333881	4
Cobalt	D	7.46	0.766	2.55	mg/kg	5					
Vanadium	D	52.6	0.510	2.55	mg/kg	5					
Zinc	D	44.9	2.04	5.10	mg/kg	5					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.343	0.343	1.04	mg/kg	2	SKJ	09/30/13	2048	1333879	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/27/13	0800	1333876
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/27/13	0800	1333880
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/26/13	1649	1334135

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 8, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0015

Client Sample ID: J1RW09
Sample ID: 334065002
Matrix: SOIL
Collect Date: 23-SEP-13 07:15
Receive Date: 25-SEP-13
Collector: Client
Moisture: 7.78%

Project: WCHN00213
Client ID: WCHN001

V 10/22/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00396	0.00396	0.0118	mg/kg	1	NOR1	09/27/13	1154	1334136	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		6630	7.09	20.9	mg/kg	1	HSC	09/27/13	2211	1333881	2
Arsenic	M	65.7	0.521	3.13	mg/kg	1					
Barium		76.2	0.104	0.521	mg/kg	1					
Beryllium		0.594	0.104	0.521	mg/kg	1					
Boron	B	1.74	1.04	5.21	mg/kg	1					
Cadmium	B	0.354	0.104	0.521	mg/kg	1					
Calcium		3340	8.34	26.1	mg/kg	1					
Chromium		12.8	0.156	0.521	mg/kg	1					
Copper		12.7	0.313	1.04	mg/kg	1					
Iron		20100	8.34	26.1	mg/kg	1					
Magnesium		4150	8.86	31.3	mg/kg	1					
Manganese		317	0.209	1.04	mg/kg	1					
Molybdenum	B	0.566	0.209	1.04	mg/kg	1					
Nickel		10.6	0.156	0.521	mg/kg	1					
Potassium	*N	1700	6.67	26.1	mg/kg	1					
Silicon	*MN	J 458	1.56	10.4	mg/kg	1					
Silver	B	0.154	0.104	0.521	mg/kg	1					
Sodium		90.3	7.30	26.1	mg/kg	1					
Lead		322	0.344	1.04	mg/kg	1	JWJ	10/02/13	1113	1333881	3
Antimony	DU	1.72	1.72	5.21	mg/kg	5	HSC	10/02/13	1142	1333881	4
Cobalt	D	7.25	0.782	2.61	mg/kg	5					
Vanadium	D	52.7	0.521	2.61	mg/kg	5					
Zinc	D	50.6	2.09	5.21	mg/kg	5					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.341	0.341	1.03	mg/kg	2	SKJ	09/30/13	2135	1333879	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/27/13	0800	1333876
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/27/13	0800	1333880
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/26/13	1649	1334135

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Metals Fractional Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0015

Sample Analysis

Sample ID	Client ID
334065001	J1RW08
334065002	J1RW09
1202954622	Method Blank (MB) **ICP**
1202954623	Laboratory Control Sample (LCS)
1202954626	334065001(J1RW08L) Serial Dilution (SD)
1202954624	334065001(J1RW08D) Sample Duplicate (DUP)
1202954625	334065001(J1RW08S) Matrix Spike (MS)
1202958834	334065001(J1RW08PS) Post Spike (PS)
1202954605	Method Blank (MB) **ICP-MS**
1202954606	Laboratory Control Sample (LCS)
1202954609	334065001(J1RW08L) Serial Dilution (SD)
1202954607	334065001(J1RW08D) Sample Duplicate (DUP)
1202954608	334065001(J1RW08S) Matrix Spike (MS)
1202955261	Method Blank (MB) **CVAA**
1202955262	Laboratory Control Sample (LCS)
1202955265	334065001(J1RW08L) Serial Dilution (SD)
1202955263	334065001(J1RW08D) Sample Duplicate (DUP)
1202955264	334065001(J1RW08S) Matrix Spike (MS)

The samples in this SDG were analyzed on a "dry weight" basis.

Method/Analysis Information

Analytical Batch:	1333881, 1333879 and 1334136
Prep Batch :	1333880, 1333876 and 1334135
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-009 REV# 22, GL-MA-E-014 REV# 25 and GL-MA-E-010 REV# 26
Analytical Method:	SW846 3050B/6010C, SW846 3050B/6020A and SW846

7471B

Prep Method : SW846 3050B and SW846 7471B Prep

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 6100E inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 3607 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements
All CRDL standards met the advisory control limits with the exceptions of potassium, sodium, and antimony for samples 334065001 (J1RW08) and 334065002 (J1RW09). The PQL recovered high for potassium and antimony and low for sodium. The samples were 2x greater than the PQL for potassium and sodium but less than the MDL for antimony. The data is not adversely affected.

ICSA/ICSAB Statement
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement
The following samples were selected as the quality control (QC) samples for this SDG: 334065001 (J1RW08)-ICP, ICP-MS and CVAA.

Matrix Spike (MS) Recovery Statement
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria, with the exception of potassium and silicon, as indicated by the "N" qualifiers.

Duplicate Relative Percent Difference (RPD) Statement
The relative percent difference (RPD) obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the contract required detection limit (RL), a control of RL is used to evaluate the DUP results. All applicable analytes met these requirements, with the exception of potassium and silicon, as indicated by the "*" qualifiers.

Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the PS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The PS did not meet the recommended quality control acceptance criteria for the percent recoveries for silicon and verifies the presence of matrix interferences.

Serial Dilution % Difference Statement
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established criteria of less than 10% difference (%D), with the exception of arsenic and silicon, as indicated by the "M" qualifiers.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples 334065001 (J1RW08) and 334065002 (J1RW09) required 5x dilutions in order to bring titanium raw values within the linear range of the instrument, and antimony, cobalt, vanadium, and zinc that titanium interferes with, in order to ensure that the inter-element correction factors were valid. Samples in this SDG were diluted the standard 2x for solids on the ICPMS.

Preparation Information
The samples in this SDG were prepared exactly according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has

developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: 1227532. A copy is included in the Miscellaneous Data section of this package.

Additional Comments
Additional comments were not required for this SDG.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer: _____ **Date:** 10/8/13

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
02-OCT-13	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
ICP	SW846 3050B/6010C	Solid	WCHN
Batch ID:	**Sample Numbers:**		
1333881	See Below		

Potentially affected work order(s)(SDG): 334065(XP0015),334067(XP0016),334070(XP0017),334072(XP0018),334074(XP0019)

Application Issues:

Failed Recovery for MS/PS

Failed RPD for DUP

Other

Specification and Requirements Exception Description:	DER Disposition:
1. Failed Recovery for MS/PS: QC 1202954625MS,1202954628MS, 1202954631MS, 1202954634MS, 1202954637MS, 1202958834PS, 1202958835PS, 1202958836PS, 1202958837PS, 1202958838PS 2. Failed RPD for DUP: QC 1202954624DUP, 1202954627DUP, 1202954630DUP, 1202954633DUP, 1202954636DUP 3. Low level PQL recovered high for antimony.	1. The matrix spike recovery failed outside of the control limits for potassium,silicon,barium and copper. The post spike failed outside the required control limits for silicon and barium but passed for all other analytes. This verifies the presence of a matrix interference for silicon and barium and verifies the absence of a matrix interference for all the other analytes. Per GEL's accredited methods and SOPs, a corrective action is *not required and the data is qualified and reported.* 2. The sample and sample duplicate % RPD failed outside the control limits for potassium,silicon,manganese,zinc,cadmium and calcium due to possible sample non-homogeneity and/or matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported. 3. The samples were analyzed on 3 separate passing calibrations. The closing PQL recovered high for antimony in all 3 analyses due to possible matrix interactions. Sample #334074002 was the only one not less than the MDL or 2x greater than the PQL. The data is being reported.

Originator's Name:
Helen Camello 02-OCT-13

Data Validator/Group Leader:
Jerry Wigfall 02-OCT-13

3241065

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-232-051	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
AJ Dunnum	Joan Kessner 375-4688	KESSNER, JH	8C B 15 Days
Project Designation	**Sampling Location**	**SAF No.**	
100-IU-2 & 100-IU-6 Remaining Waste Sites	600-373	RC-232	
Ice Chest No.	**Field Logbook No.** / **COA**	**Method of Shipment**	
WCH-11-014	EL-1666-01 / 0603732000	Commerical Carrier - fed EX	
Shipped To	**Offsite Property No.**	**Bill of Lading/Air Bill No.**	
GEL Laboratories, LLC	A120953	See OSPC	

Other Labs Shipped To: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Sample Analysis
				Cool 4C	G/P	1	125mL	See item (1) in Special Instructions
				Cool 4C	aG	1	125mL	TPH-Diesel Range - WTPH-D +
				Cool 4C	aG	1	125mL	PAHs - 8310
				Cool 4C	aG	1	125mL	PCBs - 8082
J1RW08	SOIL	9-23-13	0710	X	X	X	X	
J1RW09	SOIL	9-23-13	0715	X	X	X	X	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
AJ Dunnum	9-23-13 0720	MA Bamberger	9-23-13 0720
MA Bamberger	9-23-13 1624	Char Hall	9-23-13 1624
Char Hall	9-23-2013 1630	Cindra Bingham	9-23-13 1630
Cindra Bingham	9-23-13 1638	1060 Battelle, Fridge 1A	9-23-13 1638
1060 Battelle, Fridge 1A	9-24-13 1020	C Bingham	9-24-13 1020
C Bingham WCH	9-24-13 1025	Fed EX H Taylor	
Fedex			09253 0900

FINAL SAMPLE DISPOSITION: Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}, Mercury - 7471 - (CV) {Mercury}

REVIEWED BY K. Weed via email DATE 9-24-13

XP0015

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-373			DATA PACKAGE: XP0015		
VALIDATOR: ELR		LAB: Gel		DATE: 10/22/13	
			SDG: XP0015		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J1RW04 J1RW09					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

_____

_____

_____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICP interference checks acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

_____

_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: MS - silicon (25.8%)

no DAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	No	N/A
Duplicate results acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments:_____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	N/A
ICP serial dilution %D values acceptable?	Yes	No	N/A
ICP post digestion spike required?	Yes	No	N/A
ICP post digestion spike values acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

QC Summary

Report Date: October 8, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: Joan Kessner

Workorder: 334065 Client SDG: XP0015 Project Description: RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS											
Batch 1333879											
QC1202954607 334065001 DUP											
Selenium		DU	0.343	DU	0.315	mg/kg	N/A ^			SKJ	09/30/13 20:54
QC1202954606 LCS											
Selenium	4.94			D	4.57	mg/kg		92.5	(80%-120%)		09/30/13 20:30
QC1202954605 MB											
Selenium				DU	0.325	mg/kg					09/30/13 20:24
QC1202954608 334065001 MS											
Selenium	5.32	DU	0.343	D	4.62	mg/kg		87	(75%-125%)		09/30/13 21:00
QC1202954609 334065001 SDILT											
Selenium		DU	-0.993	DU	1.72	ug/L	N/A		(0%-10%)		09/30/13 21:12
Metals Analysis-ICP											
Batch 1333881											
QC1202954624 334065001 DUP											
Aluminum			6650		6880	mg/kg	3.36		(0%-20%)	HSC	09/27/13 22:02
Antimony		DU	1.68	BCD	2.09	mg/kg	32.2 ^		(+/-4.96)		10/02/13 11:33
Arsenic		M	35.9		29.8	mg/kg	18.5		(0%-20%)		09/27/13 22:02
Barium			72.5		75.7	mg/kg	4.37		(0%-20%)		
Beryllium			0.594		0.540	mg/kg	9.54 ^		(+/-0.496)		
Boron		B	1.51	U	0.993	mg/kg	51.0 ^		(+/-4.96)		
Cadmium		B	0.289	B	0.239	mg/kg	19.1 ^		(+/-0.496)		
Calcium			3230		2980	mg/kg	8.12		(0%-20%)		
Chromium			11.5		13.9	mg/kg	18.9		(0%-20%)		
Cobalt		D	7.46	D	6.79	mg/kg	9.44 ^		(+/-2.48)		10/02/13 11:33
Copper			12.4		11.1	mg/kg	11.0		(0%-20%)		09/27/13 22:02
Iron			19600		18500	mg/kg	5.89		(0%-20%)		

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1333881										
Lead		96.8		84.2	mg/kg	13.9		(0%-20%)	JWJ	10/02/13 11:01
Magnesium		4100		4540	mg/kg	10.1		(0%-20%)	HSC	09/27/13 22:02
Manganese		309		285	mg/kg	8.19		(0%-20%)		
Molybdenum	B	0.406	B	0.497	mg/kg	20.3 ^		(+/-0.993)		
Nickel		10.1		10.2	mg/kg	0.201		(0%-20%)		
Potassium	*N	1600	*	1980	mg/kg	20.8*		(0%-20%)		
Silicon	*MN	533	*	422	mg/kg	23.2*		(0%-20%)		
Silver	B	0.316	B	0.367	mg/kg	14.8 ^		(+/-0.496)		
Sodium		87.2		85.8	mg/kg	1.70 ^		(+/-24.8)		
Vanadium	D	52.6	D	45.5	mg/kg	14.5		(0%-20%)		10/02/13 11:33
Zinc	D	44.9	D	40.6	mg/kg	10.0		(0%-20%)		
QC1202954623 LCS										
Aluminum	469			482	mg/kg		103	(80%-120%)		09/27/13 21:56
Antimony	46.9			47.5	mg/kg		101	(80%-120%)		10/02/13 11:27
Arsenic	46.9			46.8	mg/kg		99.8	(80%-120%)		09/27/13 21:56
Barium	46.9			46.6	mg/kg		99.4	(80%-120%)		
Beryllium	46.9			47.6	mg/kg		101	(80%-120%)		
Boron	46.9			46.1	mg/kg		98.3	(80%-120%)		
Cadmium	46.9			48.3	mg/kg		103	(80%-120%)		
Calcium	469			498	mg/kg		106	(80%-120%)		
Chromium	46.9			45.7	mg/kg		97.4	(80%-120%)		
Cobalt	46.9			47.9	mg/kg		102	(80%-120%)		10/02/13 11:27

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1333881										
Copper	46.9			47.0	mg/kg		100	(80%-120%)	HSC	09/27/13 21:56
Iron	469			474	mg/kg		101	(80%-120%)		
Lead	46.9			48.8	mg/kg		104	(80%-120%)	JWJ	10/02/13 10:55
Magnesium	469			513	mg/kg		109	(80%-120%)	HSC	09/27/13 21:56
Manganese	46.9			45.8	mg/kg		97.7	(80%-120%)		
Molybdenum	46.9			45.4	mg/kg		96.9	(80%-120%)		
Nickel	46.9			48.1	mg/kg		103	(80%-120%)		
Potassium	469			479	mg/kg		102	(80%-120%)		
Silicon	469			403	mg/kg		86	(80%-120%)		
Silver	46.9			47.8	mg/kg		102	(80%-120%)		
Sodium	469			450	mg/kg		95.9	(80%-120%)		
Vanadium	46.9			47.6	mg/kg		102	(80%-120%)		10/02/13 11:27
Zinc	46.9			47.9	mg/kg		102	(80%-120%)		
QC1202954622 MB										
Aluminum			U	6.59	mg/kg					09/27/13 21:53
Antimony			B	0.534	mg/kg					10/02/13 11:24
Arsenic			U	0.484	mg/kg					09/27/13 21:53
Barium			U	0.0969	mg/kg					
Beryllium			U	0.0969	mg/kg					
Boron			U	0.969	mg/kg					
Cadmium			U	0.0969	mg/kg					
Calcium			U	7.75	mg/kg					

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1333881											
Chromium				U	0.145	mg/kg				HSC	09/27/13 21:53
Cobalt				U	0.145	mg/kg					10/02/13 11:24
Copper				U	0.291	mg/kg					09/27/13 21:53
Iron				U	7.75	mg/kg					
Lead				U	0.320	mg/kg				JWJ	10/02/13 10:53
Magnesium				U	8.24	mg/kg				HSC	09/27/13 21:53
Manganese				U	0.194	mg/kg					
Molybdenum				U	0.194	mg/kg					
Nickel				B	0.146	mg/kg					
Potassium				B	6.36	mg/kg					
Silicon				U	1.45	mg/kg					
Silver				U	0.0969	mg/kg					
Sodium				U	6.78	mg/kg					
Vanadium				U	0.0969	mg/kg					10/02/13 11:24
Zinc				U	0.388	mg/kg					
QC1202954625 334065001 MS											
Aluminum	509		6650		9080	mg/kg	N/A	(75%-125%)			09/27/13 22:05
Antimony	50.9	DU	1.68	D	44.7	mg/kg	84.8	(75%-125%)			10/02/13 11:36
Arsenic	50.9	M	35.9		84.6	mg/kg	95.6	(75%-125%)			09/27/13 22:05
Barium	50.9		72.5		123	mg/kg	98.3	(75%-125%)			
Beryllium	50.9		0.594		50.6	mg/kg	98.2	(75%-125%)			
Boron	50.9	B	1.51		50.3	mg/kg	95.7	(75%-125%)			

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1333881											
Cadmium	50.9	B	0.289		50.3	mg/kg		98.2	(75%-125%)	HSC	09/27/13 22:05
Calcium	509		3230		3880	mg/kg		N/A	(75%-125%)		
Chromium	50.9		11.5		60.7	mg/kg		96.6	(75%-125%)		
Cobalt	50.9	D	7.46	D	58.6	mg/kg		100	(75%-125%)		10/02/13 11:36
Copper	50.9		12.4		66.5	mg/kg		106	(75%-125%)		09/27/13 22:05
Iron	509		19600		21000	mg/kg		N/A	(75%-125%)		
Lead	50.9		96.8		136	mg/kg		76.4	(75%-125%)	JWJ	10/02/13 11:03
Magnesium	509		4100		4890	mg/kg		N/A	(75%-125%)	HSC	09/27/13 22:05
Manganese	50.9		309		365	mg/kg		N/A	(75%-125%)		
Molybdenum	50.9	B	0.406		48.5	mg/kg		94.5	(75%-125%)		
Nickel	50.9		10.1		59.2	mg/kg		96.4	(75%-125%)		
Potassium	509	*N	1600	N	2250	mg/kg		127*	(75%-125%)		
Silicon	509	*MN	533	N	661	mg/kg		25.2*	(75%-125%)		
Silver	50.9	B	0.316		52.1	mg/kg		102	(75%-125%)		
Sodium	509		87.2		576	mg/kg		96	(75%-125%)		
Vanadium	50.9	D	52.6	D	104	mg/kg		102	(75%-125%)		10/02/13 11:36
Zinc	50.9	D	44.9	D	95.8	mg/kg		99.9	(75%-125%)		
QC1202958834 334065001 PS											
Potassium	5000	*N	15700	C	21700	ug/L		120	(80%-120%)		10/02/13 13:43
Silicon	5000	*MN	5220		22900	ug/L		354*	(80%-120%)		
QC1202954626 334065001 SDILT											
Aluminum			65200	D	13700	ug/L	4.75		(0%-10%)		09/27/13 22:07
Antimony		DU	2.96	CD	4.40	ug/L	N/A		(0%-10%)		10/02/13 11:39

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1333881										
Arsenic	M	351	DM	77.4	ug/L	10.2*		(0%-10%)	HSC	09/27/13 22:07
Barium		710	D	147	ug/L	3.65		(0%-10%)		
Beryllium		5.82	D	1.24	ug/L	6.49		(0%-10%)		
Boron	B	14.8	DU	5.10	ug/L	N/A		(0%-10%)		
Cadmium	B	2.84	DU	0.510	ug/L	N/A		(0%-10%)		
Calcium		31700	D	6580	ug/L	3.88		(0%-10%)		
Chromium		112	D	22.5	ug/L	.156		(0%-10%)		
Cobalt	D	14.6	D	3.18	ug/L	8.98		(0%-10%)		10/02/13 11:39
Copper		121	D	23.4	ug/L	3.24		(0%-10%)		09/27/13 22:07
Iron		192000	D	40500	ug/L	5.59		(0%-10%)		
Lead		948	D	189	ug/L	.104		(0%-10%)	JWJ	10/02/13 11:05
Magnesium		40200	D	8370	ug/L	4.21		(0%-10%)	HSC	09/27/13 22:07
Manganese		3030	D	641	ug/L	5.81		(0%-10%)		
Molybdenum	B	3.98	DU	1.02	ug/L	N/A		(0%-10%)		
Nickel		99.3	CD	21.0	ug/L	5.6		(0%-10%)		
Potassium	*N	15700	CD	3360	ug/L	6.76		(0%-10%)		
Silicon	*MN	5220	DM	1190	ug/L	13.7*		(0%-10%)		
Silver	B	3.10	D	1.04	ug/L	67.6		(0%-10%)		
Sodium		854	D	168	ug/L	1.84		(0%-10%)		
Vanadium	D	103	D	20.0	ug/L	3.09		(0%-10%)		10/02/13 11:39
Zinc	D	88.0	D	16.8	ug/L	4.7		(0%-10%)		

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-Mercury										
Batch 1334136										
QC1202955263 334065001 DUP Mercury	U	0.00425	B	0.00436	mg/kg	106 ^		(+/-0.0126)	NOR1	09/27/13 11:49
QC1202955262 LCS Mercury	0.119			0.121	mg/kg		102	(80%-120%)		09/27/13 11:46
QC1202955261 MB Mercury			B	-0.00457	mg/kg					09/27/13 11:44
QC1202955264 334065001 MS Mercury	0.126	U 0.00425		0.139	mg/kg		109	(80%-120%)		09/27/13 11:51
QC1202955265 334065001 SDILT Mercury		U 0.021	DU	0.0212	ug/L	N/A		(0%-10%)		09/27/13 11:53

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Date: 28 October 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-373
Subject: PCB - Data Package No. XP0015-GEL

INTRODUCTION

This memo presents the results of data validation on Data Package No. XP0015 prepared by GEL Laboratories (GEL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RW08	9/23/13	Soil	C	See note 1
J1RW09	9/23/13	Soil	C	See note 1

1 – PCBs by 8082A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

· Holding Times

Holding times are not applicable for PCB analysis.

· Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in

the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field (equipment) Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. XP0015 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: XP0015	REVIEWER: ELR	Project: 600-373	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 30, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-232 Soil

Client SDG: XP0015

Client Sample ID:	J1RW08	Project:	WCHN00213
Sample ID:	334065001	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	23-SEP-13 07:10		
Receive Date:	25-SEP-13		
Collector:	Client		
Moisture:	7.42%		

V 10/27/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor-1016	U	1.20	1.20	3.59	ug/kg	1	YS1	09/27/13	1301	1334323	1
Aroclor-1221	U	1.20	1.20	3.59	ug/kg	1					
Aroclor-1232	U	1.20	1.20	3.59	ug/kg	1					
Aroclor-1242	U	1.20	1.20	3.59	ug/kg	1					
Aroclor-1248	U	1.20	1.20	3.59	ug/kg	1					
Aroclor-1254	U	1.20	1.20	3.59	ug/kg	1					
Aroclor-1260	U	1.20	1.20	3.59	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXS4	09/26/13	1730	1334322

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.53 ug/kg	7.19	76.9	(44%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.73 ug/kg	7.19	79.7	(35%-119%)

Notes:

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 30, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0015

Client Sample ID: J1RW09
Sample ID: 334065002
Matrix: SOIL
Collect Date: 23-SEP-13 07:15
Receive Date: 25-SEP-13
Collector: Client
Moisture: 7.78%

Project: WCHN00213
Client ID: WCHN001

10/27/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor-1016	U	1.20	1.20	3.60	ug/kg	1	YS1	09/27/13	1313	1334323	1
Aroclor-1221	U	1.20	1.20	3.60	ug/kg	1					
Aroclor-1232	U	1.20	1.20	3.60	ug/kg	1					
Aroclor-1242	U	1.20	1.20	3.60	ug/kg	1					
Aroclor-1248	U	1.20	1.20	3.60	ug/kg	1					
Aroclor-1254	U	1.20	1.20	3.60	ug/kg	1					
Aroclor-1260	U	1.20	1.20	3.60	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXS4	09/26/13	1730	1334322

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.82 ug/kg	7.21	80.7	(44%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.81 ug/kg	7.21	80.7	(35%-119%)

Notes:

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

PCB Case Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0015

Method/Analysis Information

Procedure:	**Analysis of Polychlorinated Biphenyls by ECD**
Analytical Method:	SW846 3541/8082A
Prep Method:	SW846 3541
Analytical Batch Number:	1334323
Prep Batch Number:	1334322

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3541/8082A:

Sample ID	Client ID
334065001	J1RW08
334065002	J1RW09
1202955738	Method Blank (MB)
1202955739	Laboratory Control Sample (LCS)
1202955740	334065002(J1RW09) Matrix Spike (MS)
1202955741	334065002(J1RW09) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 334065002 (J1RW09) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recoveries for this SDG were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recoveries for this SDG were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina. Additionally, copper was added to all sample extracts to remove sulfur.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG in this batch.

Miscellaneous Information

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

Manual Integrations
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The front column has been chosen as the primary column. The data are reported from the front column for all samples in this batch.

Due to software issue, the surrogate recovery range was not indicated in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

System Configuration

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um
ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

331065

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-232-051	Page 1 of 1

Collector: AJ Dunnum	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location: 600-373		SAF No.: RC-232
Ice Chest No.: WCH-11-014	Field Logbook No.: EL-1666-01	COA: 0603732000	Method of Shipment: Commerical Carrier - Fed EX
Shipped To: GEL Laboratories, LLC	Offsite Property No.: A120953		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8C B | Data Turnaround: 15 Days 7

Other Labs Shipped To: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS
None

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	aG	aG	aG
No. of Container(s)	1	1	1	1
Volume	125mL	125mL	125mL	125mL
Sample Analysis	See item (1) in Special Instructions	TPH-Diesel Range - WTPH-D +	PAHs - 8310	PCBs - 8082

Sample No.	Matrix	Sample Date	Sample Time				
J1RW08	SOIL	9-23-13	0710	X	X	X	X
J1RW09	SOIL	9-23-13	0715	X	X	X	X

CHAIN OF POSSESSION Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
AJ Dunnum	9-23-13 0720	MA Bamberger	9-23-13 0720
MA Bamberger	9-23-13 1624	CHAR HALL C.Hall	9-23-13 16:24
Char Hall C.Hall	9-23-2013 16:30	Cindra Bingham	9-23-13 1630
Cindra Bingham	9-23-13 1638	1060 Battelle, Fridge 1A	9-23-13 1638
1060 Battelle, Fridge 1A	9-24-13 1020	C.Bingham	9-24-13 1020
C.Bingham WCH	9-24-13 1025	Fed EX	
Fedex		H Taylor	092513 0900

FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time

SPECIAL INSTRUCTIONS
(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY K. Weed vincent DATE 9-24-13

XP0015

WCH-EE-011

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Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-373			DATA PACKAGE: XP0015		
VALIDATOR: ELR		LAB: Gel		DATE: 10/28/13	
			SDG: XP0015		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J1RW08 J1RW09					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... Yes No N/A
Surrogate recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments:

no PAS

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A
Duplicate results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
Field duplicate RPD values acceptable? ..... Yes No N/A
Field split RPD values acceptable? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A
Positive results resolved acceptably? ..... Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	N/A
Compound quantitation acceptable? (Levels D, E)	Yes	No	N/A
Results reported for all requested analyses?	Yes	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	N/A
Samples properly prepared? (Levels D, E)	Yes	No	N/A
Detection limits meet RDL?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments:_____

_____

_____

_____

_____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed?	Yes	No	N/A
Lot check performed?	Yes	No	N/A
Check recoveries acceptable?	Yes	No	N/A
GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments:_____

_____

_____

_____

_____

Appendix 6

Additional Documentation Requested by Client

QC Summary

Report Date: September 30, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: Joan Kessner

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Semi-Volatiles-PCB										
Batch 1334323										
QC1202955739 LCS										
Aroclor-1016	33.2			27.5	ug/kg		82.7	(39%-120%)	YS1	09/27/13 11:42
Aroclor-1260	33.2			30.5	ug/kg		91.9	(50%-116%)		
**4cmx	6.64			5.99	ug/kg		90.2	(44%-106%)		
**Decachlorobiphenyl	6.64			6.41	ug/kg		96.5	(35%-119%)		
QC1202955738 MB										
Aroclor-1016			U	1.11	ug/kg					09/27/13 11:31
Aroclor-1221			U	1.11	ug/kg					
Aroclor-1232			U	1.11	ug/kg					
Aroclor-1242			U	1.11	ug/kg					
Aroclor-1248			U	1.11	ug/kg					
Aroclor-1254			U	1.11	ug/kg					
Aroclor-1260			U	1.11	ug/kg					
**4cmx	6.64			4.88	ug/kg		73.5	(44%-106%)		
**Decachlorobiphenyl	6.64			5.53	ug/kg		83.2	(35%-119%)		
QC1202955740 334065002 MS										
Aroclor-1016	36.1	U	1.20	25.3	ug/kg		70.1	(25%-125%)		09/27/13 13:47
Aroclor-1260	36.1	U	1.20	26.5	ug/kg		73.5	(28%-127%)		
**4cmx	7.23		5.82	4.88	ug/kg		67.5	(44%-106%)		
**Decachlorobiphenyl	7.23		5.81	5.39	ug/kg		74.6	(35%-119%)		
QC1202955741 334065002 MSD										
Aroclor-1016	36.1	U	1.20	29.3	ug/kg	14.4	81.1	(0%-30%)		09/27/13 13:58

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Semi-Volatiles-PCB										
Batch 1334323										
Aroclor-1260	36.1	1.20	U	30.2	ug/kg	12.9	83.7	(0%-30%)		
**4cmx	7.22	5.82		6.10	ug/kg		84.5	(44%-106%)	YS1	09/27/13 13:58
**Decachlorobiphenyl	7.22	5.81		6.13	ug/kg		85	(35%-119%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Date: 28 October 2013
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-373
Subject: Polyaromatic Hydrocarbon - Data Package No. XP0015-GEL

INTRODUCTION

This memo presents the results of data validation on Data Package No. XP0015 prepared by GEL Laboratories (GEL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1RW08	9/23/13	Soil	C	See note 1
J1RW09	9/23/13	Soil	C	See note 1

1 – Polyaromatic Hydrocarbons by 3550B.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Analytes must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field (equipment) Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of

compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. XP0015 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: XP0015	REVIEWER: ELR	Project: 600-373	PAGE_1_OF_1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 30, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-232 Soil

Client SDG: XP0015

Client Sample ID:	J1RW08	Project:	WCHN00213
Sample ID:	334065001	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	23-SEP-13 07:10		
Receive Date:	25-SEP-13		
Collector:	Client		
Moisture:	7.42%		

✓ 10/27/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3550 PAH Std list Soil "Dry Weight Corrected"											
Acenaphthene	U	5.39	5.39	18.0	ug/kg	1	LER	09/27/13	1309	1334318	1
Acenaphthylene	U	5.39	5.39	18.0	ug/kg	1					
Anthracene	TU	1.80	1.80	18.0	ug/kg	1					
Benzo(a)anthracene		4.94	0.575	1.80	ug/kg	1					
Benzo(a)pyrene		5.26	0.575	1.80	ug/kg	1					
Benzo(b)fluoranthene		4.47	0.575	1.80	ug/kg	1					
Benzo(ghi)perylene	U	0.575	0.575	1.80	ug/kg	1					
Benzo(k)fluoranthene	U	0.288	0.288	0.899	ug/kg	1					
Chrysene		5.74	0.575	1.80	ug/kg	1					
Dibenzo(a,h)anthracene	U	0.575	0.575	1.80	ug/kg	1					
Fluoranthene		6.93	0.575	1.80	ug/kg	1					
Fluorene	U	5.39	5.39	18.0	ug/kg	1					
Indeno(1,2,3-cd)pyrene	U	0.575	0.575	1.80	ug/kg	1					
Naphthalene	U	5.39	5.39	18.0	ug/kg	1					
Phenanthrene	U	5.39	5.39	18.0	ug/kg	1					
Pyrene		7.87	0.575	1.80	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3550B	3550B PAH BY HPLC Prep in soil	AXV1	09/26/13	1642	1334317

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3550 PAH Std list Soil "Dry Weight Corrected"	6430 ug/kg	8990	71.6	(23%-104%)

Notes:

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 30, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-232 Soil

Client SDG: XP0015

Client Sample ID:	J1RW09	Project:	WCHN00213
Sample ID:	334065002	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	23-SEP-13 07:15		
Receive Date:	25-SEP-13		
Collector:	Client		
Moisture:	7.78%		

10/27/13

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3550 PAH Std list Soil "Dry Weight Corrected"											
Acenaphthene	U	5.41	5.41	18.0	ug/kg	1	LER	09/27/13	1516	1334318	1
Acenaphthylene	U	5.41	5.41	18.0	ug/kg	1					
Anthracene	TU	1.80	1.80	18.0	ug/kg	1					
Benzo(a)anthracene		18.7	0.577	1.80	ug/kg	1					
Benzo(a)pyrene		15.4	0.577	1.80	ug/kg	1					
Benzo(b)fluoranthene		12.3	0.577	1.80	ug/kg	1					
Benzo(ghi)perylene		10.1	0.577	1.80	ug/kg	1					
Benzo(k)fluoranthene	U	0.288	0.288	0.901	ug/kg	1					
Chrysene		20.3	0.577	1.80	ug/kg	1					
Dibenzo(a,h)anthracene	J	1.05	0.577	1.80	ug/kg	1					
Fluoranthene		24.9	0.577	1.80	ug/kg	1					
Fluorene	U	5.41	5.41	18.0	ug/kg	1					
Indeno(1,2,3-cd)pyrene	U	0.577	0.577	1.80	ug/kg	1					
Naphthalene	U	5.41	5.41	18.0	ug/kg	1					
Phenanthrene		24.1	5.41	18.0	ug/kg	1					
Pyrene		32.8	0.577	1.80	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3550B	3550B PAH BY HPLC Prep in soil	AXV1	09/26/13	1642	1334317

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3550 PAH Std list Soil "Dry Weight Corrected"	6380 ug/kg	9010	70.9	(23%-104%)

Notes:

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

HPLC-PAH
WC-HANFORD, INC. (WCHN)
SDG XP0015

Method/Analysis Information

Procedure:	**Polynuclear Aromatic Hydrocarbons**
Analytical Method:	SW846 8310
Prep Method:	SW846 3550B
Analytical Batch Number:	1334318
Prep Batch Number:	1334317

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

Sample ID	Client ID
334065001	J1RW08
334065002	J1RW09
1202955729	Method Blank (MB)
1202955730	Laboratory Control Sample (LCS)
1202955731	334065001(J1RW08) Matrix Spike (MS)
1202955732	334065001(J1RW08) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

Initial Calibration
All initial calibration requirements have been met for this SDG.

CCV Requirements
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
All the surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 334065001 (J1RW08) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS (1202955731) did not meet acceptance criteria for the recovery of Anthracene at 91.4%. The limits are 49-91%. Since the recovery was biased high and Anthracene was not detected in the parent sample, 334065001 (J1RW08), the data are considered unaffected. The LCS (1202955730) met acceptance criteria for all target analytes. The data are "T" qualified and reported with the appropriate DER.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPDs between the MS and MSD met the acceptance limits.

Technical Information:

Holding Time Specifications
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information:

Data Exception (DER) Documentation
Data Exception Report 1226519 was generated for this SDG.

The MS (1202955731) did not meet acceptance criteria for the recovery of Anthracene at 91.4%. The limits are 49-91%. Since the recovery was biased high and Anthracene was not detected in the parent sample, 334065001 (J1RW08), the data are considered unaffected. The LCS (1202955730) met acceptance criteria for all target analytes. The data are "T" qualified and reported with the appropriate DER.

Manual Integrations
Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

Additional Comments
The Form 8 is used only as a sequence of the analysis.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. The data validator will always sign and date the case narrative.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100 uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

Chromatographic Columns

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
30-SEP-13	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
LC-MS/MS	SW846 8310	Solid	WCHN
Batch ID:	**Sample Numbers:**		
1334318	1202955731		

Potentially affected work order(s)(SDG): 334065(XP0015)

Application Issues:

Failed Recovery for MS/PS

Specification and Requirements Exception Description:	DER Disposition:
1. The MS (1202955731) did not meet acceptance criteria for the recovery of Anthracene at 91.4%. The limits are 49-91%.	1. Since the recovery was biased high and Anthracene was not detected in the parent sample, 334065001 (J1RW08), the data are considered unaffected. The LCS (1202955730) met acceptance criteria for all target analytes. The data are "T" qualified and reported with the appropriate DER. The discrepancy is noted in the Case Narrative.

Originator's Name:
Lynne Russell 30-SEP-13

Data Validator/Group Leader:
Michael Penny 30-SEP-13

3341065

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-232-051 | Page 1 of 1

Collector: AJ Dunnum	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location: 600-373		SAF No.: RC-232
Ice Chest No.: WCH-11-014	Field Logbook No.: EL-1666-01	COA: 0603732000	Method of Shipment: Commerical Carrier - Fed EX
Shipped To: GEL Laboratories, LLC	Offsite Property No.: A120953		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8C / B (was 9-19-13 7) | Data Turnaround: 15 Days

Other Labs Shipped To: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	125mL	125mL	125mL	125mL							
Sample Analysis	See item (1) in Special Instructions	TPH-Diesel Range - WTPH-D +	PAHs - 8310	PCBs - 8082							

Sample No.	Matrix	Sample Date	Sample Time										
J1RW08	SOIL	9-23-13	0710	X	X	X	Y						
J1RW09	SOIL	9-23-13	0715	X	X	X	Y						

CHAIN OF POSSESSION / Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
AJ Dunnum	9-23-13 0720	MA Bamberger	9-23-13 0720
MA Bamberger	9-23-13 1624	CHAR HALL	9-23-13 16:24
CHAR HALL	9-23-2013 16:30	Cindra Bingham	9-23-13 1630
Cindra Bingham	9-23-13 1638	1060 Battelle, Bldg 1A	9-23-13 1638
1060 Battelle, Bldg 1A	9-24-13 1020	C Bingham	9-24-13 1020
C Bingham	9-24-13 1025	Fed EX	
		H Taylor	092513 0900

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) (Mercury)

REVIEWED BY K. Weed Vicente DATE 9-24-13

XP0015

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-373			DATA PACKAGE: XP0015		
VALIDATOR: ELR		LAB:		DATE: 10/22/13	
			SDG: XP0015		

ANALYSES PERFORMED					
8015	8021	8141	8151	8315	8310
		WTPH-HCID	WTPH-G	WTPH-D	

SAMPLES/MATRIX:

J1RW08 J1RW09

Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

GENERAL ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries aceptable? ..... Yes No N/A

Check materials traceable? ..... Yes No N/A

Check materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

QC Summary

Report Date: September 30, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: Joan Kessner

Workorder: 334065 Client SDG: XP0015 Project Description: RC-232 Soil

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH									
Batch 1334318									
QC1202955730 LCS									
Acenaphthene	1670		1390	ug/kg		83.6	(58%-99%)	LER	09/27/13 12:27
Acenaphthylene	1670		1380	ug/kg		83	(58%-98%)		
Anthracene	1670		1510	ug/kg		90.6	(63%-94%)		
Benzo(a)anthracene	167		152	ug/kg		91	(73%-98%)		
Benzo(a)pyrene	167		144	ug/kg		86.4	(63%-99%)		
Benzo(b)fluoranthene	167		146	ug/kg		87.7	(70%-130%)		
Benzo(ghi)perylene	167		145	ug/kg		87.1	(70%-130%)		
Benzo(k)fluoranthene	83.3		69.0	ug/kg		82.9	(70%-130%)		
Chrysene	167		167	ug/kg		100	(70%-130%)		
Dibenzo(a,h)anthracene	167		170	ug/kg		102	(70%-130%)		
Fluoranthene	167		139	ug/kg		83.6	(70%-130%)		
Fluorene	1670		1420	ug/kg		85.3	(65%-130%)		
Indeno(1,2,3-cd)pyrene	167		156	ug/kg		93.4	(70%-130%)		
Naphthalene	1670		1350	ug/kg		80.9	(57%-130%)		
Phenanthrene	1670		1410	ug/kg		84.8	(70%-130%)		
Pyrene	167		150	ug/kg		90.3	(70%-130%)		
**Decafluorobiphenyl	8330		7050	ug/kg		84.7	(23%-104%)		
QC1202955729 MB									
Acenaphthene		U	4.99	ug/kg					09/27/13 11:45
Acenaphthylene		U	4.99	ug/kg					

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH										
Batch 1334318										
Anthracene			U	1.66	ug/kg					
Benzo(a)anthracene			U	0.532	ug/kg				LER	09/27/13 11:45
Benzo(a)pyrene			U	0.532	ug/kg					
Benzo(b)fluoranthene			U	0.532	ug/kg					
Benzo(ghi)perylene			U	0.532	ug/kg					
Benzo(k)fluoranthene			U	0.266	ug/kg					
Chrysene			U	0.532	ug/kg					
Dibenzo(a,h)anthracene			U	0.532	ug/kg					
Fluoranthene			U	0.532	ug/kg					
Fluorene			U	4.99	ug/kg					
Indeno(1,2,3-cd)pyrene			U	0.532	ug/kg					
Naphthalene			U	4.99	ug/kg					
Phenanthrene			U	4.99	ug/kg					
Pyrene			U	0.532	ug/kg					
**Decafluorobiphenyl	8320			6410	ug/kg		77	(23%-104%)		
QC1202955731 334065001 MS										
Acenaphthene	1800	U	5.39	1440	ug/kg		79.9	(49%-90%)		09/27/13 13:51
Acenaphthylene	1800	U	5.39	1430	ug/kg		79.6	(48%-97%)		
Anthracene	1800	TU	1.80 T	1640	ug/kg		91.4*	(49%-91%)		
Benzo(a)anthracene	180		4.94	163	ug/kg		87.9	(29%-126%)		
Benzo(a)pyrene	180		5.26	159	ug/kg		85.7	(26%-130%)		
Benzo(b)fluoranthene	180		4.47	156	ug/kg		84.4	(32%-135%)		
Benzo(ghi)perylene	180	U	0.575	155	ug/kg		86.1	(34%-125%)		

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH										
Batch 1334318										
Benzo(k)fluoranthene	89.9	U	0.288	75.4	ug/kg		83.9	(48%-142%)	LER	09/27/13 13:51
Chrysene	180		5.74	180	ug/kg		96.9	(39%-127%)		
Dibenzo(a,h)anthracene	180	U	0.575	180	ug/kg		100	(38%-130%)		
Fluoranthene	180		6.93	154	ug/kg		81.9	(20%-139%)		
Fluorene	1800	U	5.39	1510	ug/kg		83.8	(51%-90%)		
Indeno(1,2,3-cd)pyrene	180	U	0.575	169	ug/kg		94	(41%-145%)		
Naphthalene	1800	U	5.39	1300	ug/kg		72.3	(43%-87%)		
Phenanthrene	1800	U	5.39	1530	ug/kg		85	(50%-100%)		
Pyrene	180		7.87	168	ug/kg		89.3	(18%-149%)		
**Decafluorobiphenyl	8990		6430	6780	ug/kg		75.4	(23%-104%)		
QC1202955732 334065001 MSD Acenaphthene	1790	U	5.39	1420	ug/kg	1.50	79	(0%-30%)		09/27/13 14:33
Acenaphthylene	1790	U	5.39	1410	ug/kg	1.62	78.6	(0%-30%)		
Anthracene	1790	TU	1.80	1620	ug/kg	1.31	90.5	(0%-30%)		
Benzo(a)anthracene	179		4.94	165	ug/kg	1.37	89.4	(0%-30%)		
Benzo(a)pyrene	179		5.26	161	ug/kg	0.916	86.7	(0%-30%)		
Benzo(b)fluoranthene	179		4.47	159	ug/kg	1.52	85.9	(0%-30%)		
Benzo(ghi)perylene	179	U	0.575	156	ug/kg	1.03	87.3	(0%-30%)		
Benzo(k)fluoranthene	89.6	U	0.288	77.1	ug/kg	2.18	86	(0%-30%)		
Chrysene	179		5.74	179	ug/kg	0.372	96.8	(0%-30%)		
Dibenzo(a,h)anthracene	179	U	0.575	179	ug/kg	0.514	99.8	(0%-30%)		
Fluoranthene	179		6.93	158	ug/kg	2.43	84.3	(0%-30%)		

QC Summary

Workorder: 334065 **Client SDG:** XP0015 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH											
Batch 1334318											
Fluorene	1790	U	5.39		1480	ug/kg	1.60	82.7	(0%-30%)	LER	09/27/13 14:33
Indeno(1,2,3-cd)pyrene	179	U	0.575		167	ug/kg	1.44	92.9	(0%-30%)		
Naphthalene	1790	U	5.39		1270	ug/kg	2.62	70.6	(0%-30%)		
Phenanthrene	1790	U	5.39		1510	ug/kg	1.02	84.4	(0%-30%)		
Pyrene	179		7.87		173	ug/kg	2.92	92.4	(0%-30%)		
**Decafluorobiphenyl	8960		6430		6670	ug/kg		74.4	(23%-104%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the *requirements of the NELAC standard unless qualified on the QC Summary.*